June 2024

Key guiding principles on the methodology for assessing greenhouse gas emissions savings from low-carbon hydrogen

WindEurope calls for a robust definition for low-carbon hydrogen in the upcoming Delegated Act (DA) pursuant to Article 9 of the recast EU Directive on gas and hydrogen markets.

Direct electrification is the most cost-effective and energy-efficient way to decarbonise final energy demand and achieve the EU's climate and energy goals. But since parts of the energy system cannot be electrified directly, renewable hydrogen will play a key role as the most cost-effective and sustainable method of decarbonising hard-to-abate sectors.

Renewable hydrogen is produced using electricity from renewable sources and emits no greenhouse gases (GHG) during production. Only renewable hydrogen counts towards meeting the EU renewable energy and decarbonisation targets. It is therefore crucial to differentiate the value of renewable hydrogen compared to low-carbon hydrogen.

The recast EU Directive on gas and hydrogen markets defines low-carbon hydrogen as hydrogen with an energy content that is derived from non-renewable sources, and which meets the greenhouse gas emission reduction threshold of 70% compared to the fossil fuel comparator. A robust definition to calculate greenhouse gas emissions reduction of low-carbon hydrogen (LCH) and a methodology to calculate emissions are key to providing market players with investment certainty.

WindEurope welcomes the specification in Article 9 of the Directive that the LCH methodology will cover life-cycle GHG emissions and will consider indirect emissions. This would include the treatment of emissions due to hydrogen leakage, methane upstream emissions and downstream carbon capture rates. It is vital that the LCH methodology ensures that it can contribute to effectively mitigating GHG emissions.

The following elements should be included in the low-carbon hydrogen Delegated Act:

1) Full life-cycle assessment and transparent verification

It is crucial to establish clear system boundaries, within which all GHG emissions will be accounted for, including up-, mid- and down-stream emissions. The full lifecycle emissions assessment should be based on project-specific data to measure the footprint of low-carbon fuels/hydrogen[1] and deliver genuine emissions reductions of at least 70% compared to the fossil fuel comparator established in the Renewable Energy Directive.

We recognise the need to develop a monitoring, reporting and verification framework. This would be used to provide confidence that projects can deliver verifiable climate benefits through a full life-cycle assessment, independently verified by a third party. The exact GHG intensity of low-carbon hydrogen should be made transparent.

To produce hydrogen by reforming natural gas through the steam reforming (SMR) process, electricity is commonly used to extract methane and to run the carbon capture unit. It is essential to ensure that the GHG footprint of this electricity is taken into account when tallying the total emissions of the fuel

[1] In line with the EU Regulation on Methane Emissions Reduction in the Energy Sector and the standards of the Oil and Gas Methane Partnership ('OGMP') 2.0 framework

produced. The methodology for the life-cycle assessment should therefore recognise the GHG intensity of electricity used in the production of low-carbon hydrogen.

2) Carbon capture and storage

The methodology should be aligned with the requirements for secure geological storage of **carbon dioxide** (CO2) as per Directive 2009/31/EC on the geological storage of carbon dioxide. Furthermore, emissions from the capturing and processing of carbon dioxide have to be taken into account in the calculation applying the appropriate emission factors.

The certification methodology should include an obligation to measure the carbon capture and storage (CCS) rate based on actual CO2 captured and sequestrated. This should be done to avoid substantial amounts of carbon continuing to be released into the atmosphere when hydrogen is produced. Only hydrogen produced from facilities that can abate enough CO2 to meet the GHG reduction threshold should be certified as low carbon.

The use of carbon offsetting to demonstrate compliance with the emissions reduction threshold of at least 70% should not be permitted.

For CCS activities outside the European Economic Area (EEA), they must demonstrate that they are subject to carbon storage requirements and certification similar to those in the EEA.

3) Methane leakage

On a 100-year timescale, **methane** has 28 times greater global warming potential than carbon dioxide and is 84 times more potent on a 20-year timescale. Methane leakage should therefore be the core focus of the life-cycle GHG assessment of low-carbon hydrogen.

Upstream emissions encompass all the greenhouse gas emissions produced before methane is converted into hydrogen. Therefore, methane emissions must be accounted from the start, incorporating emissions from the supply of inputs, processing, and transporting it[2]. Any exceptions for installations would result in a "knock-on effect" and, ultimately, a significant GHG emissions lock-in.

Therefore, safeguards should be defined in the methodology and implemented with the definition of a maximum upstream methane leakage rate. These requirements would encourage the uptake of the best available performance standards and reward industry initiatives which aim to eliminate its methane footprint.

It is important that the DA is aligned with the methodology of the EU Regulation on Methane Emissions Reduction in the Energy Sector for the monitoring, reporting and verification (MRV) requirements, including collection and publication of data.

4) Hydrogen leakage

Monitoring **hydrogen leakage** is important to maximise the climate benefits of low-carbon hydrogen. According to the Hydrogen and Decarbonised Gas Market Directive, the treatment of emissions due to the leakage of hydrogen needs to be taken into account. Therefore, the DA should make sure that strong monitoring and verification requirements apply from its entry into force to minimise possible risks of hydrogen leakage.

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[2] European Commission Recommendation on the use of the Environmental Footprint methods (16.12.2021) (LINK) and Annex I on the Product Environmental Footprint Method, including life cycle inventory (LINK).